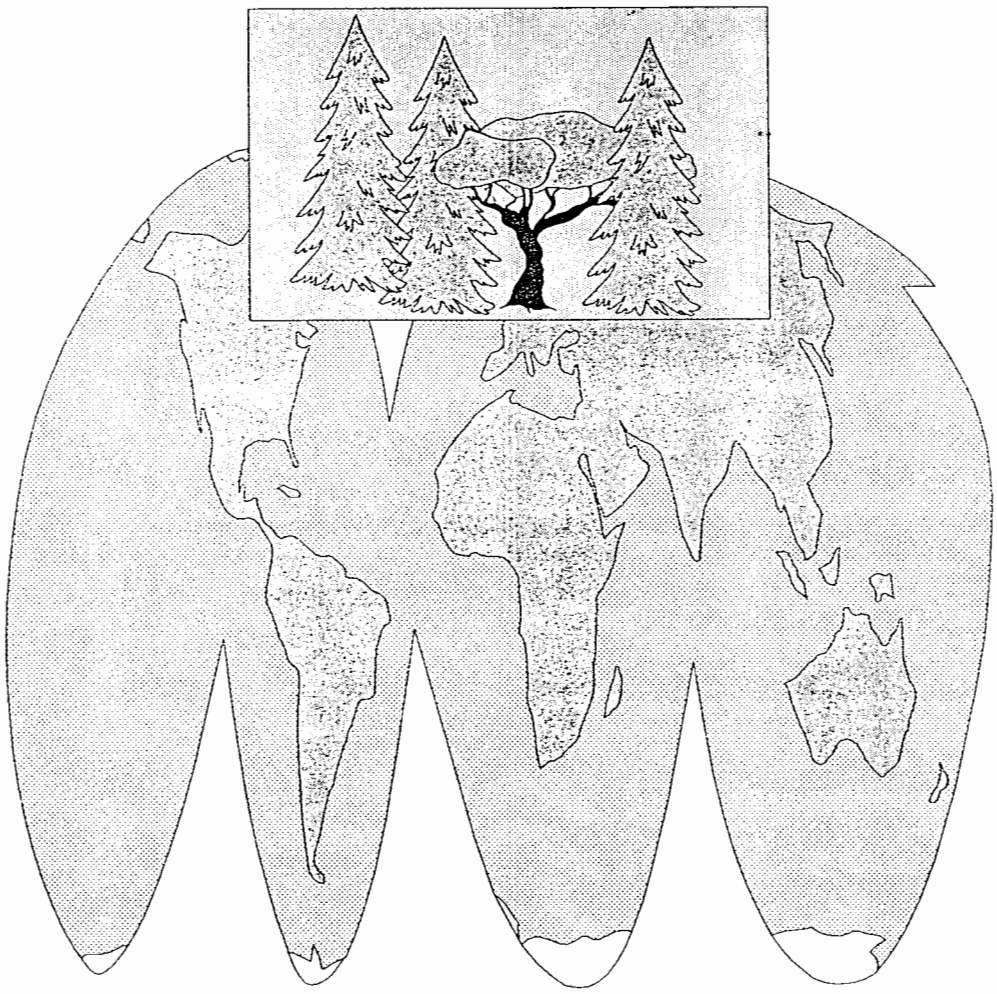
The Locational Suitability for An International Forestry "Entity"



Prepared for:

The Agriculture, Food and Nutrition Sciences Division
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Ottawa, Canada

Report Supporting the Locational Suitability of an International Forestry "Entity"

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List of Acronyms

AFEN	Asian Forestry Education Network
BOSTID	Board on Science and Technology for International Development
CGIAR	Consultative Group on International Agricultural Research
FAO	Food and Agriculture Organization
FF	Ford Foundation
F/FRED	Forestry/Fuelwood Research and Development Project
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IDRC	International Development Research Centre
IFS	International Foundation for Science
ILO	International Labour Office
JICA	Japan International Cooperation Agency
MPTS	Multipurpose Tree Species Research Network
NFTA	Nitrogen Fixing Tree Association
NORMNET	Northern Thailand Natural Resource Management Network
RF	Rockefeller Foundation
SAREC	Swedish Agency for Research Cooperation with Developing Countries
UNU	United Nations University
USAID	United States Agency for International Development

INTRODUCTION

This report summarizes the results of a statistical study carried out to examine the locational suitability of an international forestry "entity", as determined by the CGIAR. Since the statistical search was based on secondary data, the defined regions were found to vary greatly. For instance, some studies defined "Asia" as Asian CPE countries alone, while others included the Far East, Near East as well as Asian CPE countries. For the sake of consistency, this report examines the broadly-defined regions of Africa (Sub-Saharan countries), Asia (the Far East and Asian CPE countries) and Latin America (the countries of South and Central America). At the same time, this report does not claim absolute consistency. Several constraints became apparent throughout the study: the available data did not always include a list of the countries under consideration; regional studies were sometimes marked by poor country representation, and; in many cases, the methodology for data collection was not uniform. As such, the report does not attempt to make any conclusions. Rather, as initially intended, it provides a descriptive analysis of available statistical findings related to forestry activities and concerns.

Six topics are examined in this report: (i) population and forest resources, (ii) land use, (iii) forest production and trade, (iv) deforestation and reafforestation, (v) government and institutional priority given to forestry, and (vi) initiatives, institutes and networks involved in forestry. A brief narrative with illustrative maps and graphs describes the available information. In addition, a summarized version of the statistical findings are presented. Upon request, detailed statistics are available in a supporting document with attached appendices.

A. POPULATION AND FOREST RESOURCES[1]

In 1990, the total population of Asia, 3,108 million (M), is almost five times greater than that of Africa (647 M) and seven times greater than that of Latin America (448 M). Asia also has the highest percentage of people living in rural areas. As 1990 figures indicate, Asia's rural population accounts for 70 percent of the total, compared with 65 percent in Africa and 35 percent in Latin America (World Resources 1990-91: 270,271). As illustrated by the map in Table 1 (page 2), the process of urbanization has been much slower in Asia and Africa than in Latin America.

Related to the rate of urbanization, although indirectly, Latin America also has the highest GNP per capita. As the map in Table 2 (page 3) indicates, a large proportion of South America in particular, has a GNP per capita of $600 - 2500 US. In Africa and

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[1] See page 19 of this report for supporting statistical data.

TABLE 1

URBANIZATION
(in percent)

= Above 80
= 60-80
= 40-60
= 20-40
= Below 20

Source: IBM Software: PC Gobe, 1989

TABLE 2

GNP PER CAPITA
(in $US)

= Above 10,000
= 2,500-10,000
= 600-2,500
= 150-600
= Below 150

Source: IBM Software: PC Globe 1989

Asia, the majority of countries have a GNP per capita of $150 - 600 US. Also unique to Latin America is its rate of forest per capita which, at 1.8 hectare per person, is significantly greater than that of either Africa (.7 ha per person) or Asia (.1 ha per person) (FAO, "An Interim Report", 1988).

Despite the relatively low forest area per capita in Asia, it appears that more people in this region are dependent upon forest resources than in Latin America or Africa. Although figures representing informal forest activities are not readily available, data on formal forestry employment suggest that Asians are far more reliant upon forests than people living in the other two regions. According to the ILO Yearbook of Labour Statistics (1989: 354-395), in 1985 in Asia, employment in agriculture, hunting, forestry and fishing was 94,275 thousand people, five times greater than that of Latin America (19,089 thousand) and more than a hundred times greater than that of Africa (676 thousand). This information is somewhat misleading, however, in that the study included only sixteen African countries and no disaggregated figures were available for the forestry sector alone.

Nevertheless, the Yearbook did present information on those involved in the manufacturing of forest resources. In Asia in 1985, 623 thousand people were employed in the manufacturing of wood products and 833 thousand people were working in the pulp and paper industry. These numbers are significantly greater than that of the other two regions. In 1985 in Africa, the total number of people employed in the manufacturing of forest resources was 130 thousand and, in Latin America, 122 thousand (ILO 1989: 479-514).

The population dependent upon fuelwood for energy consumption is greater in Asia as well. According to the Forestry Department of the FAO, the percentage of the population dependent upon fuelwood is actually higher in Africa (57 percent) than in Asia (25 percent) or Latin America (16 percent). However, with a considerably larger agricultural population, and total population, figures suggest that more than 222 million people in Asia are dependent upon fuelwood for their energy consumption, compared with 198 million in Africa and 30 million in Latin America (FAO Forestry Department, 30 January 1991).

B. LAND USE[2]

Based on a survey of land use in the 1980s (World Resources 1990-91), of the three regions considered in this report, Latin America has the largest area of forests and woodlands. This region has 721 million hectares of closed forests and 207 million hectares of open forests, composing a total of 928 million hectares. This figure is 1.3 times greater than the total forest area of Africa (684 million ha), and 1.9 times greater than that of Asia (496.5

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[2] See page 20 of this report for supporting statistical data.

million ha).

According to J.P. Lanly, by the end of 1980, closed broadleaved and other natural forests covered 885 million hectares of land in Latin America, compared to 699 million in Africa and 298 million in Asia. The only area in which Latin America has not come out ahead is with respect to plantations. In 1980 in Asia, forest plantations covered 5.15 million hectares of land, compared to 4.6 million in Latin America and 1.8 million in Africa (FAO n.d.: 7).

Finally, as a percentage of total land area, in 1988, forests and woodlands cover 47 percent of the land in Latin America. As illustrated in Table 3 (page 6), this amount is significantly greater than that of either Africa (27 percent) or Asia (25 percent). Although in some specific cases the other two regions have greater forest representation, all in all, Latin America has a relatively greater area of forests and woodlands (FAO Production 1989: 47-58).

C. FOREST PRODUCTION AND TRADE[3]

When it comes to the production and trade of forest products, Asia is clearly ahead of the other two regions. In 1987, the total volume of forest production in Asia was 1,016,452 thousand cubic meters, two and a half times greater than that of both Africa (408,022 - 000 m3) and Latin America (420,993 - 000 m3). For instance, as illustrated in Table 4 (page ?), in 1985, natural rubber production was significantly greater in Asia than in the other two regions.

The volume of exports of forest products is greatest in Asia as well. As illustrated in Table 5 (page ?), in 1987, the volume of forest product exports from Asia amounted to 44,036 thousand cubic meters, compared with 5,206 (000 m3) from Africa and 7,891 (000 m3) from Latin America. Of interest is that more than 97 percent of Asian forest exports have originated from the Far East alone. Specific countries were not mentioned in the survey presenting this data (The State of Food and Agriculture 1989).

The volume of Asian imports of forest products is high also. According to the just mentioned study, in 1987 forest imports amounted to 35,154 thousand cubic meters in Asia, compared with 2,684 (000 m3) in Africa and 5,287 (000 m3) in Latin America. Indeed, in Asia during the 1985-87 period, the average annual net trade in roundwood was 43,144 (000 m3). Although such figures were not available for Central America, during this same time frame, the average annual net trade of roundwood for Africa and South America

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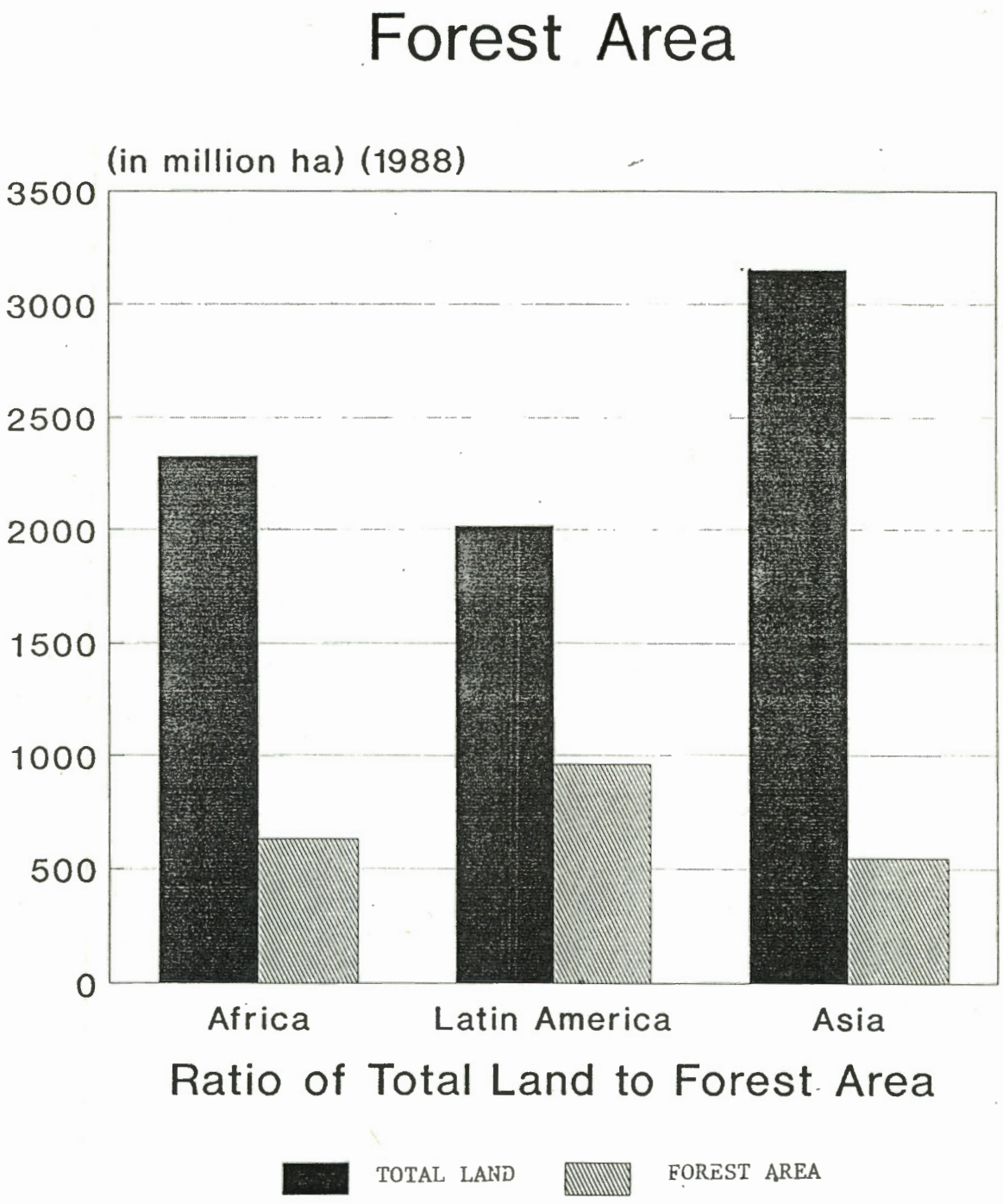
[3] See page 20 of this report for supporting statistical data. Unless otherwise indicated, this section is dependent on one source: The State of Food and Agriculture 1989, FAO Agriculture Series, Rome: FAO, 1989.

TABLE 3



Source: FAO Production 1989, Vol.43, Table 1, pp.47-58.

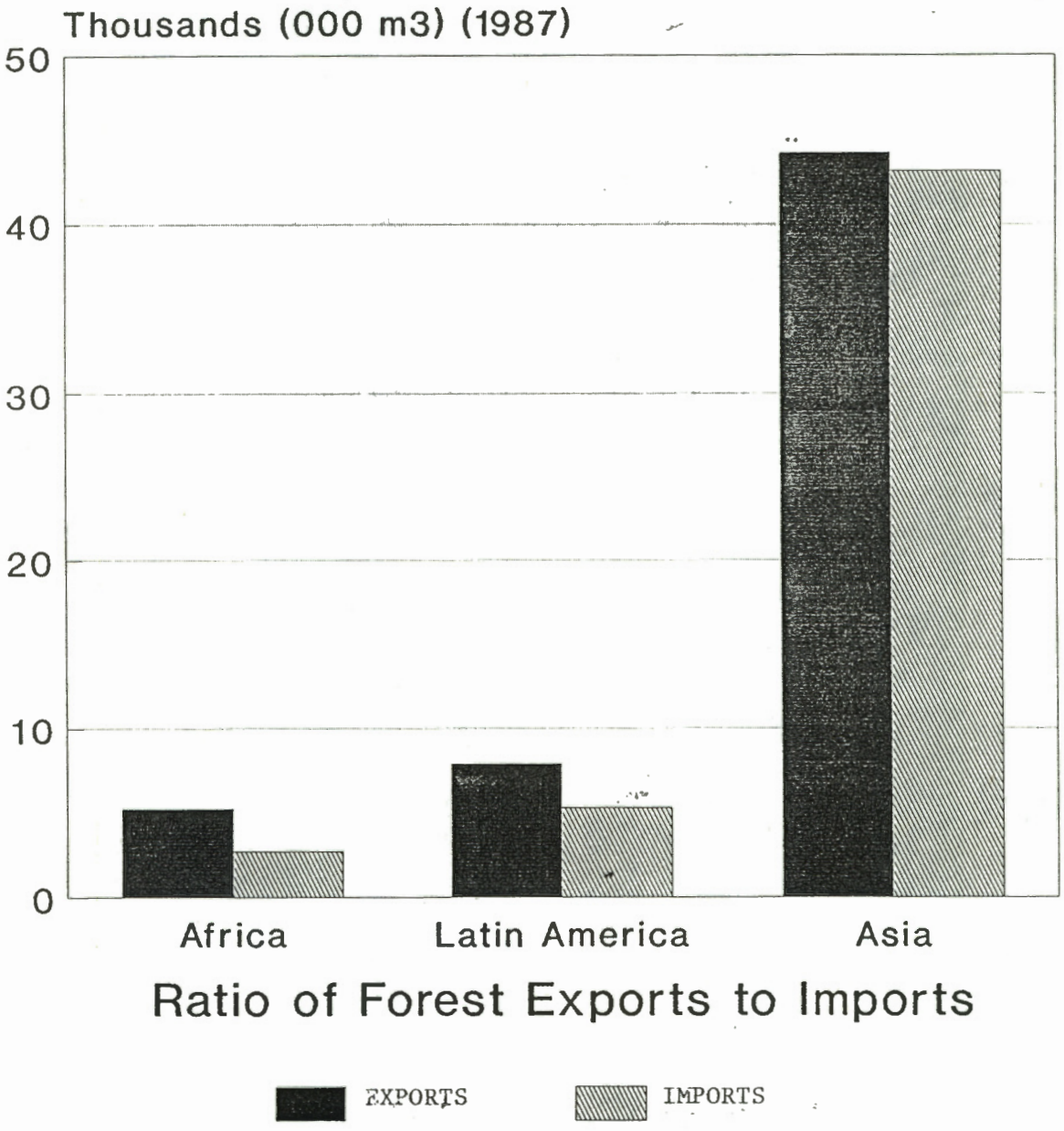
TABLE 4

NATURAL RUBBER PRODUCTION (1985)
(in 1000s of metric tons)

Source: IBM Software: PC Globe 1989

TABLE 5

Forest Exports and Imports



Source: The State of Food and Agriculture 1989, FAO Agriculture Series, No.22, Table 1, pp. 108-112.

was a negative -3,261 (000 m3) and -1,768 (000 m3) respectively (World Resources 1990-91: 294,295).

Worth noting, however, is the fact that financially Asia spends more on its imports of agriculture, fish and forestry (AFF) products ($1104 million US) than it receives for the export of such products ($619 million US). Africa is in a similar situation, spending $194 million US on AFF imports and receiving $143 million US for its export of such. Latin America, however, has a positive export:import ratio. It spends $144 million US on AFF imports, but receives close to $380 million US for the export of such products (FAO Trade Yearbook 1988: 42-44).

D. DEFORESTATION AND REAFFORESTATION[4]

Based on both projected and actual rates, Latin America has the greatest problem of deforestation. During the 1980s, the average annual rate of deforestation was 12,272 thousand hectares, compared with 3,822 (000 ha) in Africa and 4,405 (000 ha) in Asia (World Resources 1990-91: 292,293). Since then, the rate of deforestation in the Amazon forest alone has been 4.1 million hectares per year (Samenez-Mercado 1990: 22). Furthermore, as pointed out by R. Samenez-Mercado, in this region, forestry-related activities are the most important economically (:22).

Related to the issue of deforestation is the problem of timber exploitation. According to H.J. Steinlin, "Every year 4.4 million hectares of undisturbed closed forests are subjected to timber exploitation, mostly consisting of broadleaved forests" (1982: 6). In Latin America such logging practices occur at a rate of 8 m3 per hectare, compared to 13 m3 in Africa and 31 m3 in Asia. Indeed, as Steinlin argues, government-planned deforestation is far more intense in Asia than in the other two regions (1982: 6-8).

At the same time, reafforestation rates also are more extensive in Asia than in Africa or Latin America. According to World Resources 1990-91, during the 1980s, the average annual reafforestation rate was 5,708 thousand hectares in Asia, compared with 355 (000 ha) in Africa and 817 (000 ha) in Latin America (1990: 292,293). It should be noted, however, that in China alone reafforestation occurs at an average annual rate of 4,500 thousand hectares. In fact, J.P. Lanly's study on "The Status of Tropical Forests" states that annual reafforestation rates around 1980 were higher in Latin America than in the other two regions. At that time, reafforestation areas in Latin America covered .53 million hectares of land, compared with .13 million hectares in Africa and .43 million hectares in Asia.

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[4] See page 21 of this report for supporting statistical data.

Clearly, the problem of deforestation is much greater in Latin America than in Africa or Asia. What is not so clear is the degree of commitment afforded to reafforestation projects. Although Asia exhibits a significantly greater concern for reafforestation activities, over 79 percent of such efforts take place in China alone. In addition, many Asian governments actually plan and carry out deforestation practices. Whereas the problem of deforestation is more serious in Latin America than in the other two regions, local attempts to deal with this issue are given considerable attention as well.

E. PRIORITY GIVEN TO FORESTRY[5]

Data referring strictly to the support of forestry initiatives have been difficult to collect. Nevertheless, there are figures available that discuss official commitments to agriculture as a whole (including forestry initiatives). As such, it appears that the priority of governments and organizations to forestry efforts is greatest in Asia. According to The State of Food and Agriculture 1989, in 1987, of the total distribution of official commitments to agriculture from all external sources, 44 percent went to Asia, 34 percent to Africa and 22 percent to Latin America (1989: 171). Table 6.a. (page 11) illustrates these figures.

Following this trend is the World Bank. As shown in Table 6.b. (page 11), in 1990, of the forestry projects approved for IBRD and IDA assistance, $320 million US went to Asia, $170 million US to Africa and $45.5 million US to Latin America (The World Bank Annual Report 1990: 158,159). Of interest, however, is that $300 million US of the Asian funding went to China alone.

This regional trend is reflected by priorities as determined by the regions themselves. In 1980, forestry research expenditures amounted to $102 million US in Asia, compared with $27 million US in Latin America and $26 million US in Africa. Indeed, as illustrated in Table 7 (page 12), in Asia, governments have been funding 78 percent of the region's research activities on tropical forestry, compared with 69 percent in Latin America and 59 percent in Africa (Gregersen 1988: Figure 5a).

Conversely, in a recent study carried out on "Tropical Forests", the Rockefeller Foundation (RF) states that, in accordance with its new mandate to address forestry issues, its regional focus will be on the neotropics (tropical regions of the Americas). The report states:

> The value of the tropical forest resource that is at stake, the extent of devastation, the needs for improvement in the way forests are

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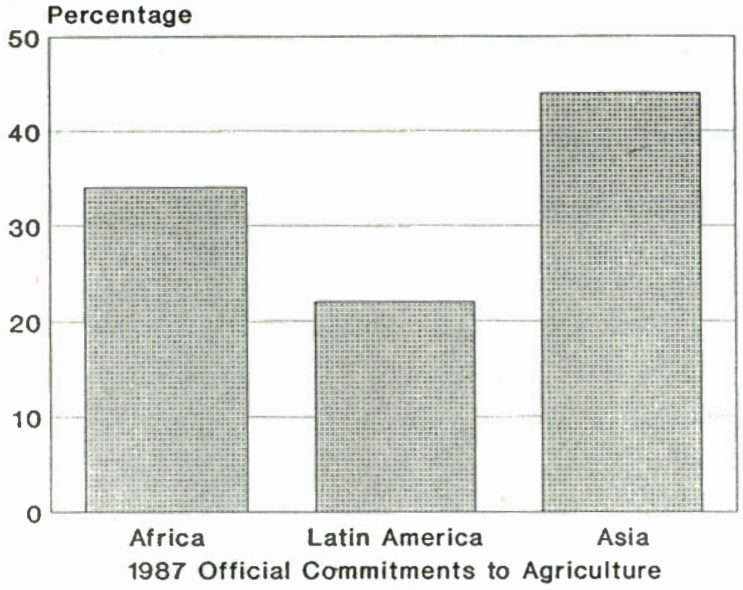
[5] See pages 21 and 22 of this report for supporting statistical data.

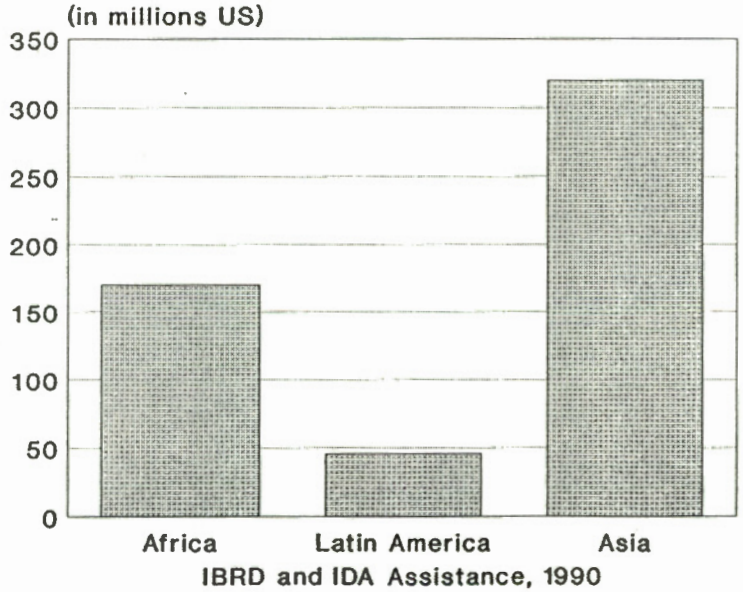
TABLE 6.a.

External Commitments to Agriculture



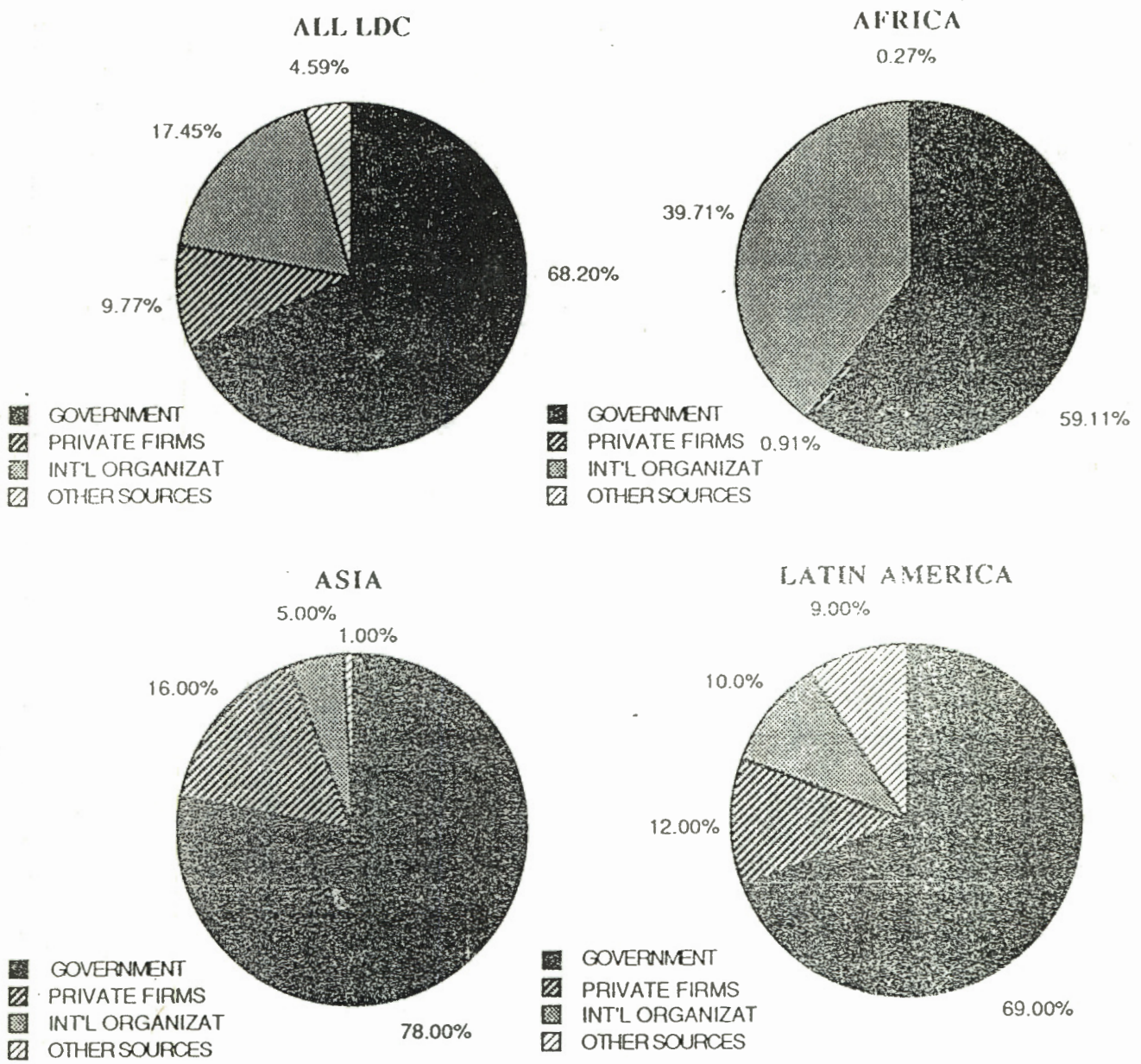
Source: The State of Food and Agriculture 1989, FAO Agriculture Series, Table 21, p.171.

World Bank Funding of Forestry Projects



Source: The World Bank Annual Report, Table 7-2, 1990.

TABLE 7



Financial sources for research on tropical forestry.
(by REGIONS)

Source: H.M. Gregersen, "The Global Tropical Forestry Research System", Background paper from the Conference on Tropical Forestry Research, 1988

> managed and the possibilities for success are generally speaking all highest in the tropical regions of the Americas ...where, in contrast, the state of knowledge about tropical forests is the lowest of any region (1990: RF4).[6]

Although, with respect to forestry issues, the Rockefeller Foundation has clearly defined the neotropics as its priority region, Latin America depends less on international assistance than the other two regions. According to a study carried out by H.M. Gregersen, Asia receives the largest amount of external funding. However, in view of its total budget for tropical forestry research, Africa is more dependent on international assistance than the other two regions. As shown in Table 8 (page 14), in Africa 71 percent of organizations carrying out research on tropical forestry receive international assistance. In Asia, 37 percent of such organizations receive international aid, as do 22 percent in Latin America (Gregersen 1988: Figure 5b).

F. INITIATIVES, INSTITUTES AND NETWORKS INVOLVED IN FORESTRY[7]

With respect to initiatives and institutes involved in forestry activities, it appears that Asia is taking the lead role, although Latin America is not far behind. As Table 9 (page 15) illustrates, in 1985, Latin America had 236 institutions engaged in forestry research, compared with 166 in Asia and 79 in Africa (FAO 1985). However, according to the World List of Forestry Schools (FAO 1977), in 1977, there were 147 forestry schools located in Asia, compared with 63 in Latin America and 58 in Africa. Furthermore, of those donors recognized by the IDRIS database (IDRC), 76 forestry projects are currently being carried out in Asia, compared with 74 in Africa and 66 in Latin America.

Available information on forestry research networks is minimal. Evidently, there are few such networks in existence, at least in any formal sense. Still, of those which have been identified, the majority are located in Asia. In piecing together various bits of information it appears that, at a minimum, there are six forestry research networks in Asia, and one each in Africa and Latin America (Farm Forestry News, Vol.4, No.1, 1990; IDRS Data Base, 3 January 1991).

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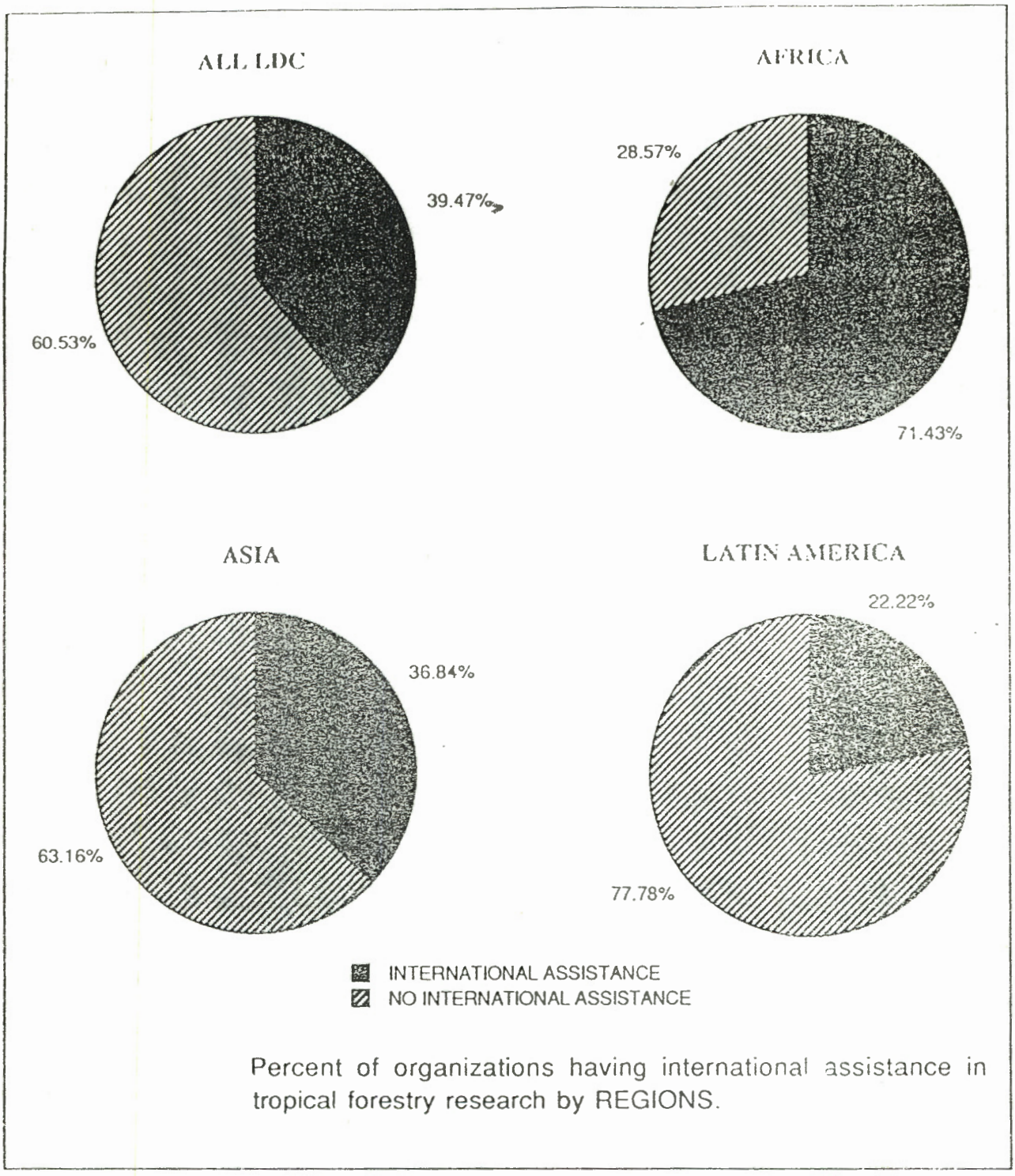
[6] For a summarized account of why the Rockefeller Foundation chose to focus on the neotropics please refer to Appendix 1.

[7] See page 22 of this report for supporting statistical data.

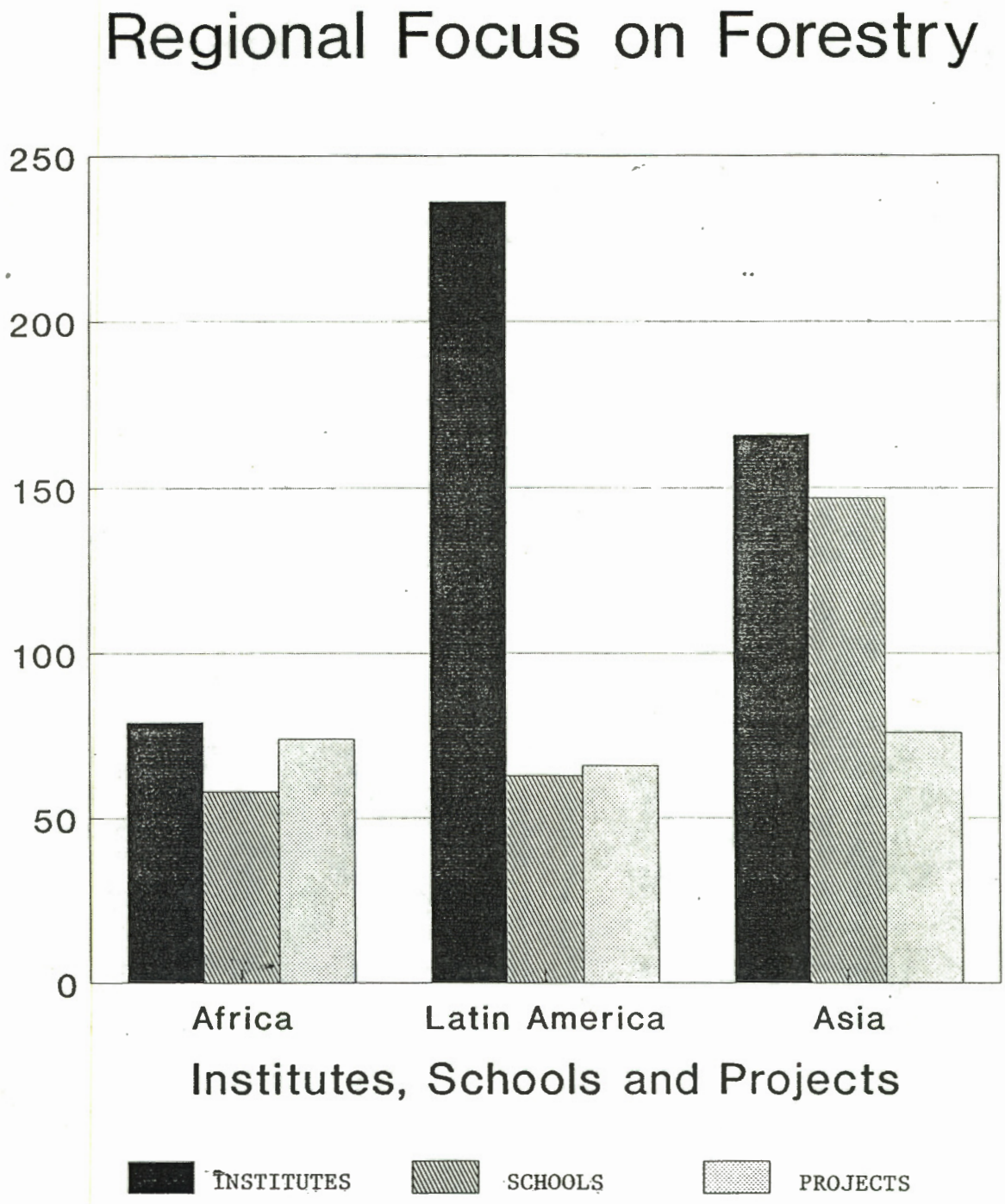
TABLE 8



Percent of organizations having international assistance in tropical forestry research by REGIONS.

Source: H.M. Gregersen, 1988.

TABLE 9



Sources: FAO World List of Institutions Engaged in Forestry and Forest Products Research, 1985; FAO World List of Forestry Schools, 1977; IDRC IDRIS Data Base, 3 January 1991.

Appendix 1
Forestry and the Rockefeller Foundation in the Neotropics

In building a case for its emphasis on the neotropics, the Rockefeller Foundation report, "Tropical Forests: A Role for The Rockefeller Foundation" (1990), gives the following reasons for such a decision:

1. The neotropics possess 58 percent of the world's tropical moist forest (TMF).

2. The biodiversity of the neotropics is by far the highest.

3. South America contains three of the largest remaining wildernesses...

4. Yet the region is least known biologically and ecologically.

5. Deforestation is taking place on a far greater scale in the neotropics than in other regions.

6. The regrowth of Amazonian forest following deforestation is especially poor.

7. A significant number of the world's threatened "hotspots" of high biodiversity are in the neotropics.

8. The neotropics have the least percentage area of closed forest in national parks and nature reserves (with the exception of Central America).

9. The global climate change that appears to be caused by deforestation in the neotropics is likely to be highly significant, as the symptoms experienced in the neotropics will be if it continues.

10. A peculiarly low percentage of TF land is suitable for settled, monoculture agriculture.

11. The expansion of the agricultural frontier is proceeding very fast ...yet there are no mechanisms to plan this well.

12. Latin America has a quarter of the world's (not just the tropics') supply of standing timber (although it has a lower proportion of species that are currently used).

13. The neotropics have the least percentage of managed TF in the world ...

14. Yet many of the natural forests are now being opened up rapidly for timber exploitation in the neotropics.

15. The considerable potentials for, and the current policy emphasis on, softwood plantations have ramifications for the use and transformations of natural forests.

16. It is estimated that 32 million people who are unemployed in Latin America are dependent on forest land for survival - but their means usually restrict them to approaches which destroy the forest and its soils.

In support of the above mentioned reasons for focusing on the neotropics, the RF report goes on to discuss current indicators of success in this region. In summarized form, these indicators are as follows:

1. Neotropical countries are beginning to cooperate regionally in matters of the environment (especially CEMAA, CARICOM, CCAD, RLB, UNAMAZ, and REDINAA).

2. Some research and training institutions are leaders in the tropics (such as Museu Goldi, INPA, IVIC, and INAP). (It should be noted, however, that the RF recognizes that where forestry is concerned, Asia is the most advanced region.)

3. The quality of foresters and forest scientists is by all accounts reasonable enough to allow fairly rapid progress.

4. There are some sophisticated NGOs emerging in the neotropics.

5. There are sizeable indigenous populations seeking to secure sustainable livelihoods in TF zones - and these are highly knowledgeable of the TF resource.

6. There is a reasonable level of understanding of forestry issues among policy-makers.

7. Local administrators are effective enough to go to work quickly, with a good chance of achieving goals.

8. Democratization is resulting in considerable decentralization of power. "Green" consciousness is growing and is having its initial impact at the political level.

9. As a result of the above, there have been positive changes in government policy concerning TF conservation and management.

The RF study also realizes the risks involved in focusing on the neotropics. Again, in summarized form, these concerns include the following:

1. Political difficulties are rife and government administrations are constantly changing.

2. There are security problems associated with working in some of the more important forest areas - lowland Peru, Columbia and Bolivia.

3. Latin Americans in general are not clear about the motivations of (US) philanthropies.

4. Being too tight in programming - there is not the level of maturity in political understanding of the role of forests, and the institutional base to implement change, that obtains in Asia.

5. The economies of current forestry practices are not efficient - forestry is overcentralized; 60 - 70 percent of the cost of raw materials is transport cost in the Amazon.

6. The enormous external debt, $421 billion (US) for Latin America and the Caribbean - larger by far than any other tropical region - creates a whole range of circumstances that encourage resource degradation.

7. The neotropics receive by far the lowest percentage of donor assistance to forestry - only 15.5 percent (figures for 1988 assistance from bilateral, UN and development banks - FAO, 1989).

(Rockefeller Foundation 1990: 82-93)

DATA SUMMARY[1]

	Africa	Latin America	Asia
A. POPULATION AND FOREST RESOURCES			
Population (in millions) (1990)	647	448	3,108
Rural Pop. as % of Total (1990)	65	35	70
* Source: World Resources 1990-91			
Agricultural Pop. (in millions)	348	118	889
Fuelwood Use as % of Total Energy Consumption	57	16	25
* Source: FAO Forestry Department, 30 Jan./91			
Agric. Labour Force as % of Agric. Population	41	36	40
* Source: The State of Food and Agriculture 1989			
Employment in Agriculture, Hunting Forestry and Fishing (1985) (in thousands)	676	19,089	94,275
* Source: ILO Yearbook of Labour Statistics 1989-90			
Forests per capita (1980)	.7	1.8	.1
* Source: "An Interim Report on the State of Forest Resources in the Developing Countries"			
Numbers Employed in the Manufacturing of Wood Products (1985) (in thousands)	76.80	40.74	623.44
Numbers Employed in the Pulp and Paper Industry (1985) (in thousands)	53.39	81.63	833.45
* Source: ILO Yearbook of Labour Statistics 1989-90			

[1] See supporting document for detailed information on sources of statistical data.

	Africa	Latin America	Asia
B. LAND USE			
Closed Forests (1980s)	219.8	721.9	409.4
Open Forests (1980s)	464.5	207.0	87.1
Total Forest Area (1980s)	684.3	929.9	496.5
* Source: World Resources 1990-91			
Closed Broadleaved Forests (1980)	215.5	653.3	258.2
Total Natural Forests (1980)	699.4	885.2	298.2
Plantations(1980)	1.8	4.6	5.2
Total (1980)	701.2	889.8	303.4
* Source: "The Status of Tropical Forests"			
Forests and Woodlands as % of Total Land (1988)	27	47	25
* Source: FAO Production 1989			
C. FOREST PRODUCTION AND TRADE (000 m3)			
Volume of Forest Production (1987)	408,022	420,993	1,016,452
Volume of Exports of ....Forest Products (1987)	5,206	7,891	44,036
Volume of Imports of ....Forest Products (1987)	2,684	5,287	34,154
Percentage Share of Total Imports ....Financed by Agric. Exports (1987)	26	31	11
* Source: The State of Food and Agriculture 1989			
Agriculture, Fish and Forestry (A, F & F) Imports (1988) ($100,000 US)	194,746	144,247	1,104,467
A, F & F Exports (1988) ($100,000 US)	143,938	379,666	619,990
* Source: FAO 1988 Yearbook: Trade			

	Africa	Latin America	Asia
D. DEFORESTATION AND REAFFORESTATION			
Projected Deforestation Rates			
....for the Year 2000 (high)	1.2	2.7	1.2
..... (low)	.7	1.1	.7
* Source: Forest for the Trees?			
Deforestation Rates (1980)	-0.5	-0.6	-0.7
Reafforestation Rates			
....(broadleaved & coniferous) (1980)	+0.13	+0.53	+0.43
* Source: "The Status of Tropical Forests"			
Ratio: Def./Reaff. (1980)	29.1	10.6	4.6
Average Annual Deforestation			
....(in 000 HA) (1980s)	3,822	12,272	4,405
Average Annual Reafforestation			
....(in 000 HA) (1980s)	355	817	5,708
* Source: World Resources 1990-91			
E. PRIORITY GIVEN TO FORESTRY			
Percentage of Distribution 0f Official Commitments to Agriculture from all Sources (1987):			
....Concessional & Non-Concessional	34	22	44
....Concessional	40	8	53
....Non-Concessional	22	49	29
* Source: The State of Food and Agriculture 1989			

	Africa	Latin America	Asia
Forestry Projects Approved for IBRD and IDA Assistance (1990) (in millions US$)	170.5	45.5	320.0
* Source: The World Bank Annual Report 1990			
Forestry Research Expenditures (1980) (in thousands US$)	25,913	26,708	102,253
* Source: "The Global Tropical Forestry Forestry Research System"			
Organizations Providing Assistance in Forestry (1986)			
.... Donor Countries	155	65	105
.... Development Banks	24	8	17
.... UN Organizations	70	21	38
TOTAL	249	94	160
* Source: Eighth Session, FAO Committee on Forest Development in the Tropics			

F. INSTITUTES AND SCHOOLS INVOLVED IN FORESTRY

Institutions Engaged in Forestry and Forest Products Research (1985)	79	236	166
* Source: Institutions Engaged in Forestry and Forest Products Research			
Forestry Schools (1977)	58	63	147
* Source: World List of Forestry Schools			
Number of Current Donor Funded Forestry Projects as Recognized by the IDRIS Data Base	74	66	76
* Source: The IDRC IDRIS Data Base			
Forestry Research Networks (1990)	1	1	6
* Source: Farm Forestry News, Vol.4, No.1; The IDRC IDRIS Data Base			

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